Native Village of Selawik
P.O. Box 59
Selawik, Alaska 99770
(907) 484-2165 Ph.
(907) 484-2226 Fax

Priorities:

1. **Gravel Source – no access to gravel source, we currently pay 60.00 a cubic yard delivered to the barge landing. Without gravel source we have no economic development. We have good grade gravel located 13 miles, located at Spud, the problem is we cannot get the gravel we need unless a permanent road is built.**

2. **New Landfill – This is our 2nd priority. The current open dump is on top of the list in Alaska as "the worst open dump". This due to several factors, to include the wetland terrain, no gravel source, no one source of funding to fund a new class 111 permitted landfill including personnel, equipment and community education to run a successful landfill.**

   What are we doing about our solid wastes issues?

   We currently have 8 open grants that are being administered by the environmental program. We don't have an agency that would do a "one time full funding of a landfill", so we have had to apply for grants to different agencies that announce possible funding. We currently have an open grant for 100,000.00 from the Denali commission to purchase super sacks and 2 burn boxes.

   Current Open Projects for 2006;

   1.8 million From the State of Alaska ADOT for a new landfill road to the new proposed site.

   2.4 million For new board roads from the State of Alaska ADOT.

   850,000.00 For upgrades to our current water and sewer system.

Summary Of Documented Health Risks Associated With Alaska Open Dump Sites – Excerpt from: *Role of Landfill Roads in Village Health*[1]

Outside of rural Alaska, open dumps that are the primary disposal site for full communities exist primarily in developing countries. Epidemiological studies on communities-- living as far as five miles away from these dumps, as well as on communities living within the "exposed zone" of closed dumps and hazardous waste sites in industrial nations, have consistently identified significant associations with decreased immunity, toxicological effects, and stress-related physical health symptoms[2] .

Inside Alaska, the handful of studies carried out appear to align well with these findings:

4.1 Health Risks Identified Specific To Inadequate Separation Distance Between Dumps And Homes

In this Section we summarize quantified health risk study results that specifically indicate a greater dumpsite-town separation distance would improve public health. YR 2001 CCTHITA study results indicate Villages are experiencing significant adverse health effects associated specifically with the close location of their open dump to their homes. To be clear, these results support the concept that locating dumpsites further from homes (accomplished simply by building landfill roads, with or without a "better" dump site at the end) could substantially reduce solid waste disposal health risks.

- In the CCTHITA epidemiological health study of four roadless Villages, people living closer than one mile to their open dump were *19 times more likely to have eye irritation,* and *3 to 4 times more likely to have headaches or faintness*[3].

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[1] Compiled by L. Zender, Ph.D., S. Gilbreath Ph.D. and S. Sebalo MS.C., Zender Environmental Science and Planning Services, Dec 2004. Before reproduction or citation of this draft document, contact Zender Environmental Services, 907 277-2111, or email lzender@zender-engr.net

[2] See for example, Vrijheid, M. Health effects of residence near hazardous waste landfill sites: A review of epidemiologic literature. *Environmental Health Perspectives,* 2000. 108(Suppl. 1): p. 101-112. Fielder, H.M.P., et al. Assessment of impact on health of residents living near the Nant-y-Gwyddon landfill site: Retrospective analysis. British Medical Journal, 2000. 320(7226): p. 19-23. Elliott, P., et al. Risk of adverse birth outcomes in populations living near landfill sites. *British Medical Journal,* 2001. 323 (7309): p. 363-368. Miller, M.S. and M.A. McGeehin. Reported health outcomes among residents living adjacent to a hazardous waste site, Harris County, Texas, 1992. *Toxicology & Industrial Health,* 1997. 13(2/3): p. 311-19. Pukkala, E. and A. Ponka. Increased incidence of cancer and asthma in houses built on a former dump area. *Environmental Health Perspectives,* 2001. 109(11): p. 1121-1125.

[3] Zender, L., S. Sebalo, S. Gilbreath, Conditions, Risks, and Contributing Factors of Solid Waste Management in Alaska Native Villages, Proc. Of the 8th. AWWMA R & D Conf., Fairbanks, Apr. 2003, Zender, L. and S. Sebalo, Full results in *A guide for closing solid waste disposal sites in Alaska Villages,* Central Council of Tlingit and Haida Indian Tribes, 2001. Also available through EPA Region 10 Office. Gilbreath, S. *Health effects associated with solid waste disposal in Alaska Native Villages,* Doctoral Dissertation, Graduate Program in Epidemiology, University of California, Davis 2004. Full methodology in Gilbreath, S. *Health effects associated with solid waste disposal in Alaska Native Villages,* Doctoral Dissertation, Graduate Program in Epidemiology, University of California, Davis 2004. Research performed by Zender Environmental Science and Planning Services, funded by CCTHITA through BIA.

- People who were bothered by dump odors or smoke, a proxy indicator for wind direction and proximity of daily activities to the dump, were over *6 times more likely to experience faintness,* and over *5 times more likely to have ear irritation.*

- Yet, the related CCTHITA comprehensive survey of 100 Villages found that a full 72% of dumps are within about one mile of homes. Based on self-reports, At least 30% are within about *one-quarter mile* of homes[4] .

4.2 Need For New Dump Sites – Health Risks Associated With Dumpsite Condition

We present in this sub-section quantified health risks related specifically to dumpsite condition. Note, the results listed here do not address whether a greater separation distance is needed. However, they do indicate that health risks could be reduced substantially by building improved landfills. And, as mentioned above, in the case of the majority of non-Hub, off-road system Villages, a new landfill site requires that a new landfill road be built first.

- In a recent retrospective cohort study[5], a number of significant associations between the condition of Village open dumps and birth outcomes and congenital anomalies were identified. **Effects on newborn babies** associated with Village open dumps that were ranked medium to high hazard condition included: **low and very low birth weight, preterm birth, and small for gestational age** (SGA). Infants born to mothers residing in Villages with high hazard dumpsite contents were significantly **more likely to have miscellaneous birth defect(s)** than other infants. The study adjusted for smoking, alcohol use, age, education, race, quality of prenatal care quality[6], and level of Village water hookup[7].

- In the CCTHITA epidemiological study, residents who regularly visited their open dump were *2 to 3.7 times more likely (i.e.* a 200% to 370% increase) to experience faintness,

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[4] Full survey results available online at the Solid Waste Alaska Network website (http://www.ccthitaswan.org/dbase/start.cfm). Methodology discussed in Zender et al, *supra* note 9.

[5] In Gilbreath, S. *Health effects associated with solid waste disposal in Alaska Native Villages,* Doctoral Dissertation, Graduate Program in Epidemiology, University of California, Davis 2004. Birth records from 1997-2001 were used to identify the 10,360 eligible infants born to mothers who resided in 197 Alaska Native Villages with dumpsite rankings. Infants born to mothers living in Villages with intermediate [(odds ratio) OR=1.64; 95% CI: 1.03, 2.63] and high hazard dumpsites (OR=1.99; 95% CI: 1.26, 3.13) had a higher proportion of low birth weight infants than infants in the referent category. Infants, on average, weighed 36 g less (95% CI: -71.2, -0.8) when born to mothers from the high exposure group than infants in the intermediate exposure group and 55.4g less (95% CI: -95.3, -15.6) than infants in the low exposure group. On average, pregnancies, lasted 1.2 days less (95% CI: -2.0, -0.3 g) in mothers from high hazard potential Villages than pregnancies in the intermediate hazard ranked Villages and 1.0 days less (95% CI: -2.0, -0.1 days) than pregnancies in the referent category. Infants born to mothers residing in Villages with high hazard dumpsite contents were more likely (RR=4.27; 95% CI: 1.76, 10.36) to have other defects than other infants. Additionally, positive odds ratios for all congenital anomalies, central nervous system anomalies, circulatory and respiratory anomalies, urogenital anomalies, musculoskeletal and integumental anomalies, multiple anomalies were found. Further, the estimates were similar to significant associations found in other birth defect studies on maternal populations living near open dump sites in developing countries, indicating that associations in Alaska Villages with these birth defect categories could be significant with a higher population size or greater exposure detail. Study to be presented at the Alaska Forum on the Environment in February 2005, (peer review publications submitted).

[6] Month prenatal care began and number of prenatal visits relative to length of pregnancy.

[7] Villages were categorized as fully plumbed, partially plumbed, or honeybucket.

fever, vomiting, stomach pain, ear and eye irritation, headache and numbness.

- In the CCTHITA 100-Village survey, at least 20 percent of Villages had dump site accidents in the past 5 years.

4.3 Need for New Dump Sites, Roads, and/or New Access – Health Risks Associated With Waste Burning Activities

We mentioned briefly how inadequate town-dump separation distance can engender increased smoke exposure from waste burning activities at the dump, how poor access can increase home-barrel burning, and how over-capacity dumps can increase waste burning activities at the dump and in-town. Each of these circumstances can be addressed by landfill road construction.

Here, we summarize briefly the specific health risks that would be addressed. Dump smoke commonly contains dioxins, carbon monoxide, nitrous oxide, and carbon dioxide. These agents have been associated with respiratory complaints, dizziness, and headaches in the short-term, and cancer and heart disease in the long-term. Exposure to smoke toxins can occur variously through inhalation, absorption through skin, and ingestion. Ingestion of smoke toxin-contaminated foods may be of particular concern in Native Villages due to the common location of outdoors subsistence drying racks, and the phenomenon of particulate deposition. Supporting the supposition that ingestion represents a significant exposure route, a number of anecdotal observations have been recorded of fish, and indeed local traditional water sources within the smoke plume, tasting differently immediately after (and during) a dump burn[8]. Additionally, it is well established that children are known to ingest dirt incidentally during play[9], and thus the risk of ingesting settled smoke toxins exists via this pathway as well.

In addition to acute and chronic toxicological effects of dump smoke exposure, a wide range of serious health risks are associated with inhaling ash and other flyables that are generated by the burn and associated with the smoke plume (particulate matter, referred to as "PM"). Smoke from open dump burning, "burnboxes", "burncages", and "burnbarrels" has a high concentration of particulate matter in comparison with emissions from the air treatment "incinerators" that are cost-infeasible for typical Village population sizes. Documented health effects associated with increased inhalation of PM include: Increased mortality, Cancer, Hospitalization, Functional Limitation, and Physiological impairment[10]. Those with impaired immune systems, cardiovascular disease, COPD, elderly individuals, infants or very young children, pre-adolescent children were found to be most susceptible to these effects. Particulate matter is indicated as a precipitator of asthma in children and adults.

Yet, in the face of these risks:

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[8] For example, in separate conversations at different times, residents from four different Villages that the authors have worked with have mentioned such an effect, unsolicited and unrelated specifically to the conversation purpose.

[9] For an interesting perspective, as well as a number of useful citations, see for example, Callahan, Gerald Eating Dirt, Emerging Infectious Diseases, Center for Disease Control, Vol 9, No. 8, August 2003, online at http://www.cdc.gov/ncidod/EID/vol9no8/03-0033.htm

[10] Vedal, Sverre M.D., M.Sc., Health Effects of inhalable particles: Implications for British Columbia Dept of Medicine Univ of British Columbia 1995.

- Burnboxes or dump fires are set often, in up to 73% of Alaska Villages.
- Over 61% of residents in the CCTHITA epidemiological study were regularly bothered by dump odors or smoke, during the course of everyday activities.
- *To avoid visiting the dump,* residents in at least 66% of Villages burn wastes just outside of homes. With no or few roads, homes generally are set very close together in native Villages, so that breathing the smoke is unavoidable.
- In the CCTHITA epidemiological study, people who burned their own trash were *5 to 17 times* more likely to feel faint, and almost *5 to 10 times* more likely to develop numbness, with the risks increasing the more often people burned. Home burners were almost *30 times* more likely than other people to have developed rashes. Other symptoms that were found to be significantly higher include fever, sore throat, and cough.

4.4 Health Risks and Considerations Associated With Increased Disease Transmission

We mentioned briefly that the exposure risk of disease transmission functionally increases with shorter town-dump separation distance and likely increases disproportionately with overcapacity sites. Both of these situations may be addressed by landfill road construction. Here we summarize studies that support this notion.

- An ongoing UAF study has confirmed for the first time that a pathogen indicator species *(E. coli* bacteria), can indeed track from open dump sites to towns, on at least ATV tires and boot footwear[11]. *E. coli* was also found to track from contaminated sites within the community, into the local school and to boardwalk locations directly adjacent to homes. While it is unclear whether dry boardwalks offer suitable conditions for *E. coli* transmission[12], moist organic material caught between tire ridges and boot grips do offer a suitable venue. From a health perspective, it should be noted that a small number of boardwalk samples adjacent to the dump also provided viable *Enterococci* (a more hardy, but less specific fecal indicator), even though *E. coli* were no longer present. Fecal source discrimination analysis appeared to eliminate pet dogs (chain-restricted) as a significant source of *E. coli* at ten of twelve sites selected for a broader geographic spread in and around the community during the experimental period.
- Honeybucket disposal is a central concern of solid waste disposal health risks in about half of isolated Villages. Thirty-three percent of these Villages have honeybucket disposal sites located adjacent to their open dump, and at least 28 percent have a single disposal site for both solid wastes and honeybucket wastes.
- In at least 30 percent of the Villages, honeybucket wastes are discarded at the dump site, or trash is discarded at the honeybucket disposal site, thus increasing exposure of residents and risk of disease transmission between households.

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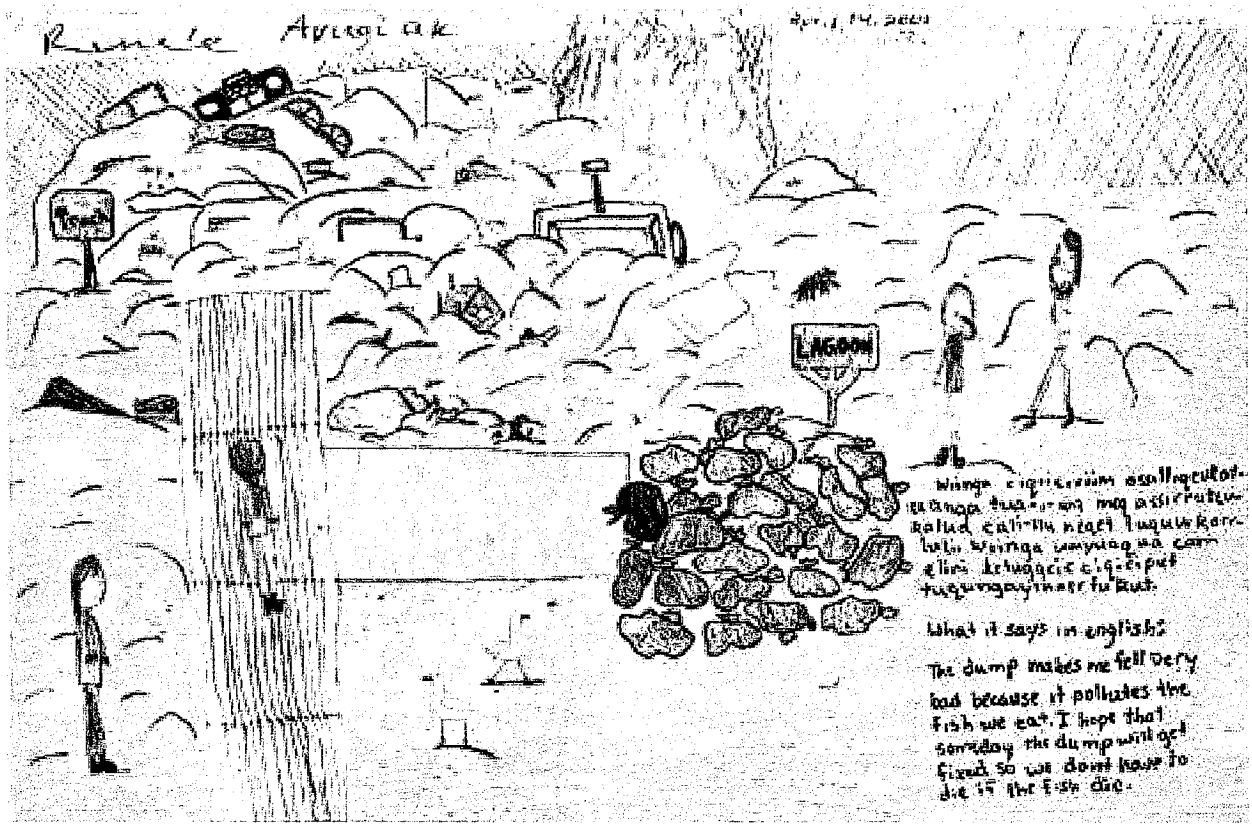
[11] Chambers, Molly, Malcom Ford, Daniel White, Silke Schiewer and Dave Barnes, *Eek Alaska, Preliminary Research and Survey Findings, Summer 2004,* Water and Environmental Research Center, University of Fairbanks, 2004.

[12] August 2004 sampling (unusually dry conditions unfavorable to *E. coli)* confirmed poor *E. coli* survival on boardwalks probably as a result of desiccation.

LEFT OUT IN THE COLD:

Solid Waste Management and the Risks to Resident Health in Native Village Alaska



Dump drawing, Rene'e Avugiak April, 2001

Results from Central Council of Tlingit and Haida Indian Tribes' Solid Waste Management (SWM) Survey and Village Health Study, Yr 2000 - 2001

General

There are 200-plus isolated and rural native villages in Alaska, and more than nine in ten of these have a community dump for their waste disposal needs. Due to logistical, infrastructural, and economic difficulties, in all but a few cases, anything transported to the villages stays in the villages. The unlined village dump is the end destination for construction wastes, hazardous wastes, vehicles, appliances, and animal carcasses, as well as run-of-the-mill trash.

The vast majority of native village waste disposal sites are open dumps.

- ✓ Although the exempted Alaska State standards are much less stringent than federal regulations, less than 5 percent of isolated native village dumps are permitted.
- ✓ Less than 30% of villages even have an SWM plan.

Due to understaffing, little management occurs at village dumps.

- ✓ Only 33% of villages have any funding for their SWM programs (including dump site operation).
- ✓ As a result, only 32% of villages have even a part-time dumpsite operator/manager.
- ✓ Many of those operators and managers are likely under-trained or under-experienced.
- ✓ Updating the database revealed that 45 percent of Village SWM contacts had left or changed jobs within just 2 years.

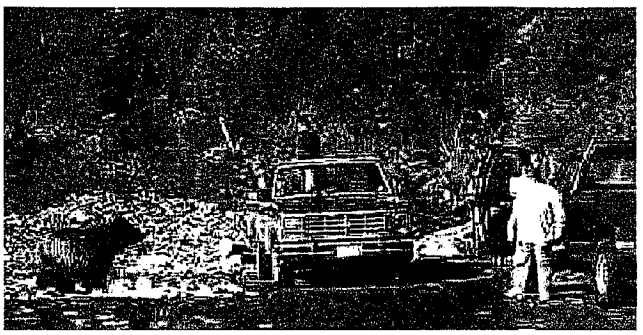
In part because the dumps are not managed, village dumps run out of space quickly, and at least 57% of villages are in imminent need of a new dump site or new waste disposal method.

- ✓ A full 38% percent of villages do not even have access to working heavy equipment.
- ✓ Trenching wastes to confine and reduce volume is often impossible due to underlying permafrost or a high ground water table.
- ✓ Compacting wastes can be problematic at the majority of dumps located on tundra. Without expensive gravel roads and a permafrost-engineered underlayer, equipment rapidly gets stuck and/or accumulatively degrades marshy tundra.

Community education about proper solid waste disposal behavior is listed as the second highest SWM need by tribes. But even with adequate community education, it would be difficult to avoid dump site health risks when discarding trash.

- ✓ At least 40% of dumps are not fenced off, so that trash scatters and animals roam. Regardless of fencing, 59% of dumps are unstaffed, so that human access is unrestricted.
- ✓ To prevent rodents, foxes, birds, and insects from becoming disease vectors, and to reduce human contact with wastes, recently dumped wastes should be frequently covered with soil. However, likely due to lack of available soil, or an operator to use it, this task is carried out only at about 6% of the dumps.
- ✓ At 25% of the dumps, it is difficult to even unload garbage, and at up to 55 % of dumps, it is generally necessary to walk on top of other garbage to find an unloading spot—an extremely risky activity.

With the lack of SWM services, most rural village households are forced to visit their dumps to discard their trash. Yet visiting the dump is fraught with health risks.



- ✓ In the health study, residents who regularly visit the dump were *2 to 3.7 times more likely* to experience faintness, fever, vomiting, stomach pain, ear and eye irritation, headache and numbness.
- ✓ At least 20 percent of villages have had dump site accidents in the past 5 years.
- ✓ In approximately 55% of the villages, bears (often grizzlies) frequent the dump.

Honeybucket disposal is part of the solid waste management health risks in about half of isolated native villages. These villages do not have household running water or sewer facilities. By and large, they use 5-gal buckets lined with plastic bags, and discard their wastes in open, unlined lagoons.

- ✓ 33 percent of these villages have honeybucket disposal sites located adjacent to the dump, and at least 28 percent have a single disposal site for both solid wastes and honeybucket wastes.
- ✓ In at least 30 percent of the villages, honeybucket wastes are discarded at the dump site, or trash is discarded at the honeybucket disposal site, thus increasing exposure of residents and risk of disease transmission between households.

Honeybucket dump, Yukon Delta Region, 2000.

Children and dump salvagers are difficult to keep away from dumps, and they may be at greatest risk, because they are more likely to stay a longer time, come into direct contact with wastes, and venture into dump interiors where walking is more treacherous.

- ✓ Especially in roadless villages in summer months, few open areas exist where children can play. Dumps serve as playgrounds in at least 14% of villages.
- ✓ With the general lack of commercial businesses in villages, dumps often serve as "hardware stores". At approximately 51% of the dumps, people scavenge through unseparated garbage (commonly including animal carcasses, medical waste, honeybucket wastes, and hazardous wastes) to find what they are looking for.

You don't need to visit the dump to suffer ill effects.

- ✓ In the health study, people living closer than one mile to their dump were *19 times* more likely to have eye irritation, and 3 to 4 times more likely to have headaches or faintness.
- ✓ People who were bothered by dump odors or smoke were over 6 times more likely to experience faintness, and over 5 times more likely to have ear irritation.
- ✓ Yet, a full 72% of dumps are within about one mile of homes. At least 30% are within *one-quarter mile* of homes.
- ✓ Because of unrestricted access and proximity to dumps, *pet dogs* often wander through, and then can transfer disease pathogens through interaction with their owners.

Many village residents have a high exposure to toxic smoke because unseparated wastes are burned at their dump.

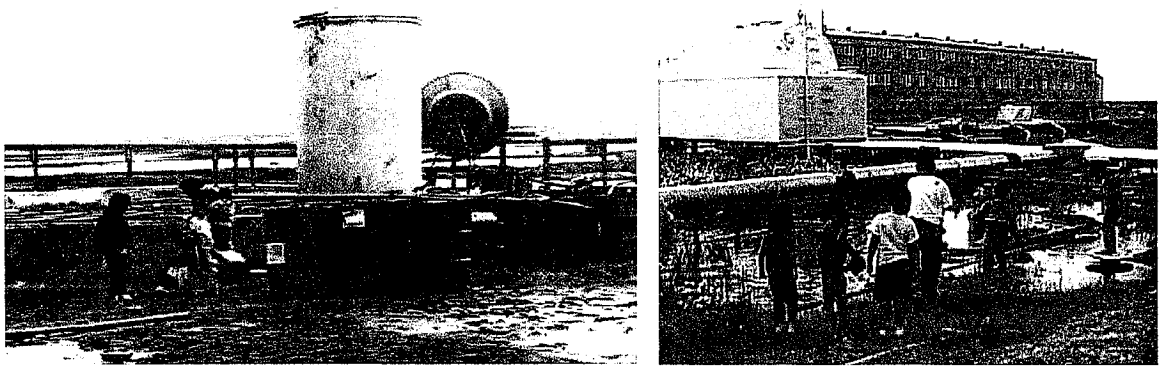
Open burning at village dump, (2000).

- ✓ Dump smoke commonly contains dioxins, carbon monoxide, nitrous oxide, and carbon dioxide. These agents have been associated with respiratory complaints, dizziness, and headaches in the short-term, and cancer and heart disease in the long-term.
- ✓ Burnboxes or dump fires are set often, in up to 73% of the villages.
- ✓ Over 61% of residents in the health study were regularly bothered by dump odors or smoke, during the course of everyday activities.

An even greater threat to resident health may be burning unseparated wastes at home.

- ✓ *To avoid visiting the dump*, residents in at least 66% of villages burn wastes just outside of homes. With no or few roads, homes generally are set very close together in native villages, so that breathing the smoke is unavoidable.
- ✓ People who burned their own trash were *5 to 17 times* more likely to feel faint, and almost *5 to 10 times* more likely to develop numbness, with the risks increasing the more often people burned.
- ✓ Home burners were almost *30 times* more likely than other people to have developed rashes. Other symptoms that were found to be significantly higher include fever, sore throat, and cough.

It is common for hazardous waste drums of antifreeze, motor oil, and other products, to be stored uncovered on the ground, and in easy reach of children.



Motor oil and antifreeze drums stored on school playground.

- ✓ Only 21 percent of villages have any place to store hazardous wastes.
- ✓ In boardwalk villages especially, open space off of the marshy tundra is very limited. It is common for hazardous wastes to be stored on school playgrounds, or next to public washing facilities.

Open dumps contaminate soil and water. Although very little data exists, we know that significant pollution around dump sites occurs throughout rural Alaska, given the available sample test results and the conditions of the vast majority of open dumps.

- ✓ A full 55 percent of villages noted signs of soil and water contamination were present at their dumpsite. At a minimum of 22% of dumps, an oil sheen is visible on standing water at the dump. Used oil from vehicles and machine parts contains a large number of toxic chemicals.
- ✓ Only 20% of villages have hazardous waste disposal programs. With no plan on how or where to discard hazardous wastes they end up in the unlined dumpsites. With nothing to prevent leachate formation or flow, toxic pollutants will migrate away from the dumps. How far they go is dependent on a variety of factors, particularly the characteristics of surface and subsurface water flow through the dump.
- ✓ *Over 56 percent of village dumps are seasonally flooded,* and/or, standing or running water is often present.

Deteriorated and leaking oil drums at Southeast dump.

Hazardous waste drums and batteries at Southeast dump

The above statistics are alarming because water can carry pollutants downstream to subsistence areas and drinking water sources.

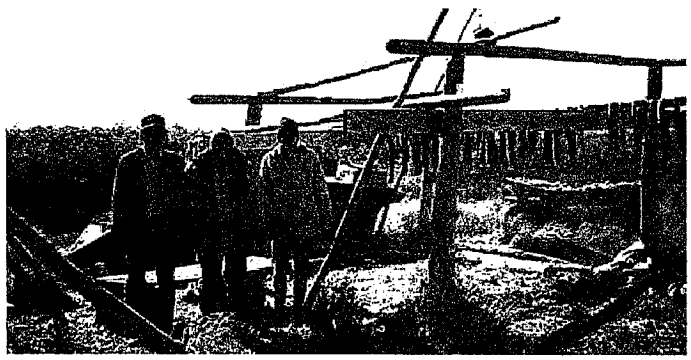
- ✓ For example, after a rain event, lead tested at 5,000 ppb in the Yukon River, just downstream of a creek outlet from a Village dump. That level is 1,000 times the EPA standard for drinking water. Much lower levels of lead are expected outside of high water-events, However, detrimental effects are noted in children after short-term exposure at 10 ppb.

- ✓ Particularly in honeybucket villages, dump site pollutants can include bacteria and viruses. Ingestion can cause gastroenteritis or transmit disease. Skin contact to highly polluted water can cause rashes and delay sore healing. At one Northwest village, bacteria levels at a drinking water intake located some 3,000 yards downstream of a dumpsite were still 4 times over acceptable levels. Several accounts of children developing skin rashes after swimming during high river flow were reported.

- ✓ Without significant water flow, pollutants may only migrate through soil for a few hundred yards (based on limited sampling). But for many native villages, even that distance is cause for serious concern -- 34% of dumps are within about one-quarter mile of a village *drinking water* source.

- ✓ Of great concern, a University of Alaska study found that drinking from "traditional water sources", such as rivers, rainwater, and snowmelt, is widespread in Villages due to complex logistical and socio-cultural, reasons. Given the preponderant location of Villages (along with their dumps) on river systems and Arctic wetland tundras, a significant population of Village residents who use traditional water are *regularly drinking untreated water* that is connected hydrologically to drainage from the dump site of the local village or its upstream neighbor.

River dump upstream from a subsistence fishing camp.



Village in the Yukon Delta Region with honeybucket lagoon and adjacent solid waste dump in foreground.

Poor dump site conditions can often lead residents to use alternative means of waste disposal that can actually increase their health and environmental risks.

- ✓ Besides increased waste burning, resulting disposal practices can include long-term storage of wastes outside of homes, increasing household vector risks.
- ✓ Residents may make use of an out-of-sight river dump or other dump site that is easier to access; thus increasing water contamination risks, and extending the problem of uncontrolled dumping to other areas outside of town. But away from town is where subsistence fish camps and hunting grounds are often located.

In-town garbage storage in Village with unsafe dump access.

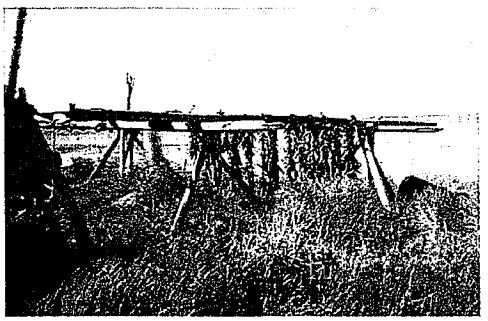
Unique in the United States, it is well documented that subsistence activities (fishing and hunting for food) are vital to both native health and culture.

- ✓ Some 80% of village residents rely on subsistence foods at least half of the time.
- ✓ In honeybucket villages, people who ate mostly subsistence foods instead of store-bought foods were *15 times less likely* to experience diarrhea.
- ✓ 63% of villages have two or fewer stores. Due to logistics, these mini-mart sized general stores are costly. Foods are largely limited to junk food, soda pop, and heavily processed food. For many natives then, maintaining a nutritious diet without subsistence foods is too difficult—logistically and/or financially. A switch to store-bought foods has been implicated as a contributory factor in the 150% increase in diabetes rate in Alaska Natives over just one decade.

Fourth of July, 2000 Celebration, Yukon Delta, Alaska.

But the poor condition of the dumps and fears of contamination greatly impact people's subsistence activities.

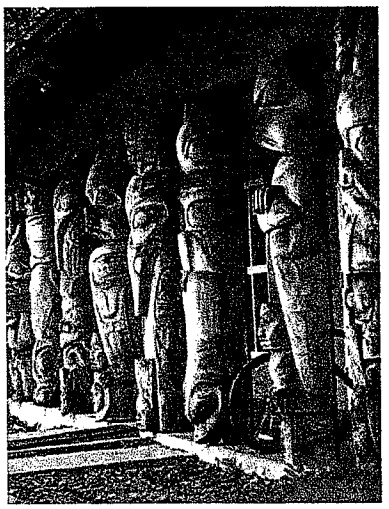
- ✓ From the health survey, some 64% of village residents have altered their subsistence activities because of the poor condition of their dump.
- ✓ In 45% of villages, hunting or fishing takes place in the vicinity of the dump.



Beyond direct health risks from dietary and active lifestyle changes, poor solid waste conditions might be contributory factors for indirect sociocultural-based health risks.

- ✓ Ethnographic observation, project documentation, and anecdotal information supplied by a number of State, Federal, and Native agency field workers and Village residents, indicate that a number of non-quantified health risks are potentially caused by the poor solid and hazardous waste conditions. When residents are forced to regularly use and see, and often daily smell the nearby uncontrolled, difficult-to-access, putrescent dumping sites, discouragement and frustration are inevitable. Left unaddressed, these responses may in turn contribute to chronic depression.
- ✓ Depression can be a significant causal factor in increased risk for societal illnesses such as alcoholism, drug use, and disrespect of authority. In the universalistic, high-context Alaska Native cultures, societal problems are documented to lead to cultural loss, an often irrevocable effect and one that has been demonstrated in the literature to spiral to ever-increasing societal problems.
- ✓ This connection between healthy communities and solid waste may also work the other way. Several solid waste improvement projects have been observed to lead to increased community pride. Pride in turn increases societal well-being, and thus potentially can contribute to more intact cultures. Many of these projects make use of traditional education and decision-making, a factor that can contribute to supporting culture.

Elder teaching child with trash collection cart in background, Interior.



Southeast Totems at Saxman.

Finally, outside the health risks to humans, dump sites can degrade the environment and harm the wildlife dependent on it.

- ✓ Unmanaged dumps can greatly affect the diversity and richness of the surrounding and downstream plant communities. This transition in turn may affect subsistence berry gathering, and/or animal feeding habits.
- ✓ Without proper dump design, tundra is destroyed, which often leads to generating an ever -increasing area of disturbance that is almost impossible to restore.
- ✓ 34% of villages report bears being killed at their dumps.

Contaminants found in Selawik water and soil and possible health consequences.

Contaminant	Short-term consequences	Long-term consequences
Arsenic	Diarrhea, constipation, nausea, fatigue, numbness, abnormal heartbeat	Thickening of skin, "corns" on palms and soles, birth defects, cancer
Chromium	Stomach pain/cramps, diarrhea, nasal irritation, respiratory problems	Nasal damage, lung damage, allergic reaction, birth defects, cancer
Lead	Stomach pain/cramps, constipation, nausea, vomiting	Organ damage, neurological damage, birth defects
Methylene Chloride	Vision and hearing impairment, nausea, numbness, dizziness	Problems end when exposure stops
2-Butanone	Respiratory, skin and eye irritation, dangerous when mixed with other compounds	Unknown
Diesel Range Organics	Rash, eye irritation, diarrhea, cough, nausea, increased blood pressure, headache, numbness	Unknown

Dependence of Selawik residents on subsistence foods:

How often subsistence foods are eaten in a resident's diet	Percent of Selawik residents at each level
Less than half the time	17%
Half the time	24%
More than half the time	58%

Community concerns on site odor/smoke:

Concern About Dumpsite Odors	Percent of residents
No concerns	30%
Some concerns	41%
Many concerns	29%

Impact of environmental concerns on our subsistence traditions:

Impact	Percent of residents
No impact	28%
Some impact	56%
Much impact	16%

Relative risk of illness symptoms according to several SWM exposure factors.

Symptom	Residents Affected (%)	Surrogate exposure examined				
		Using boat dump	Bothered by odor (i.e. living in wind path of dump)	Burning trash	Visiting dump	Having concern
Rash	8.6	--	8.0	7.8	1.9	--
Faintness	5.0	--	--	68.0	3.5	--
Fever	14.0	3.0	3.8	2.1	--	--
Stomach pain	15.1	2.0	--	2.2	2.3	2.2
Vomiting	6.6	--	--	--	3.3	2.4
Diarrhea	9.0	--	1.9	--	2.0	--
Ear irritation	7.2	--	----	--	2.2	--
Eye irritation	8.3	--	2.6	--	--	--
Congestion	21.5	--	2.2	--	2.5	--
Sore throat	15.6	2.0	2.4	--	2.1	1.8
Cough	25.2	--	--	10.0	1.7	1.9
Headache	17.1	--	--	--	3.7	--
Numbness	5.5	--	--	--	2.4	--

[a] Adjusted for race, sex, socio-economic status, household, tobacco use, and honeybucket use. Only significant results reported. Confidence intervals and methodology available upon request.

Twenty-Six Facts that People Don't Know About Solid Waste Program Logistics in an Arctic Boardwalk Village

(All of them happened in Selawik, AK)

1. How the boardwalk is in such bad condition that people get hurt all the time, and you can't even walk on it without looking down all the time and stepping carefully, and kids can't run on it or ride their bikes without falling. And that it causes so much wear and tear on the ATV used for waste collection that a new vehicle or major work is needed every year—which is almost impossible to get people to pay for so it has to be subsidized from other money that is almost impossible to find.
2. How the boardwalk can't support heavy loads so you need to upgrade it before you can use the new Bobcat -dumpster system you bought when you were hoping that either the State or federal Boardwalk improvement project wouldn't be put off another year, which they both were, again.
3. How your fuel to run anything costs almost $6 per gallon, and how you can only get it delivered during the summer.
4. How you don't have a truck to haul anything because you don't have roads (or money) and how you can spend several weeks making a metal sled for your old dozer to haul gravel a little at a time from the gravel pile that has been sitting there for 1 ½ years because there was no way to move it to the dump. How lucky you have to be to find someone in town who can weld well, but even then you have to keep reordering parts and tools because there was no design for this and you have no infrastructure for machining/welding even though you could sure use it.
5. How it took several weeks after spending all that time and money with 3 guys working full time at night (because the ground was too soft during the day) to haul just 125 "yards" of gravel just 1/2 mile away.
6. How you can't close your site or cover your wastes to reduce health risks and fires because you don't have any soil or gravel unless you pay $50 to $60 per yard to have it barged in. And how if you paid that, closing your site would cost $1.5 million and daily cover would cost households several hundred dollars each month.
7. How long it takes to build a gravel pad to site anything on permafrost, even a shed, because the ground melts and sets off a hydrogeologic process that continues to widen the melt footprint forever, and when you finally get the gravel, you can't depend on the pad being built right, and that when it isn't built right, you have to wait another year to get another one built that will work.
8. How your order for gravel is juggled around by the contractor without your say with several other summer construction jobs in the region, and you never know until the last minute if and when it will arrive that summer. If it arrives too soon, the tundra is too soft for them to deliver to the dump, and too late, the river freezes up (so it can't come) or the equipment from another job is already gone, or not enough time to move it before it freezes, etc.
9. How, consequently, gravel storage pads are at a premium so that if there is an empty one it is taken up by some other project to store their supplies, and then there is no way to move them until the barge comes next summer.

10. How, because they are understaffed and you don't have any say in which Villages and which projects get on their priority list, it can take a year to get your regional Electric Cooperative to send someone in to wire your new equipment shed that you are waiting to finish so you can start your recycling and hazardous waste program, and repair your equipment. And how in winter, because it is dark and cold all day, you need lights and heat to use the shed at all.
11. How you can cut deals with regional corporations and contractors to store their equipment instead of your own during the winter, in exchange for using their equipment to fix your dump, but when it comes time to use it, they won't give you the keys, and then by the time you do all the calling and writing to get them, the weather is too cold and their equipment won't start.
12. How the tundra is too soft to run the equipment on during summer unless you want a permanent dozer monument, but in winter snow covers the dump and everything freezes so it is almost impossible to make your dump look like the pictures in the agency manuals.
13. How when you finally get the equipment working and gravel in to build a turnaround at the dump, you end up destroying forever a beautiful piece of tundra right next to your clinic because it had to be used as a staging ground, and things went too late into the Spring so the ground wasn't frozen enough, but you couldn't wait until next Freezeup because the Village had no place to dump in the coming summer.
14. How many different times you need to call and confirm with a vendor that they will get your order to the barge, and what the dimensions and weight of your final order are, because the barge shipping costs depend on whether things fit, how they fit into the shipping container, and how much they weigh and you are on a limited budget and you have to request the correct drawdown from your grant. How many times you have to call a hauling service for them to get your order from the vendor to the barge on time.
15. How many times you have to call the barge to make sure they will ship your order, and how many times you have to re-figure the shipping costs and re-configure what you can fit into a shipping container. Then once the barge sails, how many times you have to call to see if the barge will get into the hub port soon enough to transfer your order onto the local barge before summer ends.
16. And if the order doesn't make it, how many times you have to call the local barge to make sure they plan on still sailing their late season barge and whether they'll make it to your Village, and if they are sure they have space for your order and will pick it up from the Seattle barge. Then if your order doesn't make the local barge because the Seattle barge arrived late due to a storm or the River started freezing early or there were mechanical problems, how many times you have to call both barge companies to arrange for them to hold your order till next summer, or how much time is spent trying to arrange an alternative pickup by snowmachining, flying, or boating over with someone that has a vehicle and equipment and space and time to make the trip.
17. How it freezes and unfreezes, and how difficult it is to plan for the window of opportunity to run heavy equipment at the dump (or anywhere) because it depends on weather, not the date.
18. How you don't have any garages, but if you don't store your equipment inside, it breaks down, and how long it takes to get a mechanic to fly into town and fix it once you have spent a year trying to find funding to do that, and how by that time even more is wrong with the equipment.

19. How you have to make your own scaffolding, and do all kinds of other improvising to just to do simple jobs like erect pre-cut shed kits, etc.
20. How the phones or computers go down regularly and how you don't have trained system administrators or computer techs in your Village
21. How, even when the weather is good (and it often isn't), you can never fully rely on the prop planes that are your only supply line besides the two summer barges, and the only transportation in and out, and how you won't know whether they have room until just before they leave, because you don't have any say about whether they choose to fly in a 3-seater or a 6-seater or cancel the flight because they aren't making enough money.
22. How you don't have enough operation and maintenance money to get or keep equipment or pay an operator or collector, because half of your town is unemployed and those that do have a paying job earn around per $15 an hour or less, and people pay $150 for sewer and $100 for electricity and $400 for fuel each month.
23. How the people who do have some money can't understand why they have to pay for the privilege of hauling their garbage to an open burning dump where they increase their risk several times over of getting rashes, headaches, coughs, stomach aches and other illnesses. How even if they pay someone to collect they still have to breathe the smoke from the open dump that is way too close to town because at $1.5 million per mile it is almost impossible to get funding for a road that is far away enough to be safe.
24. How when you get money to do what you need to, it usually comes too late to order anything on the barges, and by the time you can order it, the situation you are trying to address has gotten so bad that what you ordered won't be enough, or it has changed completely and you need to redo your workplan, or the State has changed their mind on what they require for a solid waste plan or landfill or whether they really will fund you like they said they would, or how you lose your State block grant because you couldn't start constructing the landfill because the State hadn't built the road yet because you couldn't find matched funding for your landfill.
25. How when people get lost in winter, everyone needs to drop what they are doing and look for them because everyone is family and you live in an environment that kills all the time, so you have to miss application and reporting deadlines even when they are really extra important to you.

And the number 26th fact people don't know about running a solid waste program in an Arctic Native Village is…..

26. How you depend on subsistence for your diet and need to take off subsistence days according to a season/weather-based time frame, because the fish and caribou don't wait for you to finish your paperwork. How everyone else in town is in the same position so that when you need something signed or need to find a file that someone else has they may not be there, and you don't have any notice because the fish and caribou didn't give notice either.

The residents of Selawik need a Multi-Purpose Facility for the community and youths under the Boys and Girls Club of America for Selawik residents.

The leaders in the community began meeting when the invitation to form a Boys and Girls was the spring of 2003 by the district office of B&G Club. A Boys and Girls Club Board was formed and two employees were hired by the Anchorage office. Since than the board has been meeting to first identify a facility. A building, which has not been in use for several years, was chosen because of the first intent of the building. The board than approached the two local governments, the local school, NVS housing program. The only possible for success of the program would only be to partnership with all who would make a difference and successfully create a sustainable program for the youth.

What has been done to date: The first need was to renovate the building and to do that funding was needed. The board first approaches the three regional entities, which are NANA Regional Corporation, and Manilaq Association, and Northwest Arctic Borough a total of $46,000.00 was donated to install one additional door, three storm sheds, and to purchase three boilers to revert the heating system. The Northwest Arctic Borough also sent an electrician to inspect the electrical hook up. He recommended rewiring the building with existing conduits. That recommendation was a surprise addition to the renovation so now the Board is looking to additional funding to do that.

April 15, 2005 an application for funding was submitted to ANA "To strengthen the youth for future village leaders." That funding announcement will be sometime this July.

What is need: What needs to continue moving forward so that the Mult- building will open for youths and adults are additional funding of $50,000. Which $24,000.00 would pay for the electrical and $26,000.00 for additional renovation of the entrance side walks and some touch up of the building..

We do not want to continue another existence of any more time; each day makes a difference for the youth. This coming winter will be another cold year for the youth standing outside by the four ways of our worn out boardwalks. We do not have any other programs for the youth in the village and they are crying out to adults with numerous suicide attempts, low self-esteem, lack of motivation and high student dropouts numbers. This facility would be a way to accommodate the youth to better communicate with them.

Our youths are respectfully handing this to you as a comment and hopefully will get a response to give direction how additional donations would be obtained. You may contact the school (907) 484-2142, City (907) 484-2132, IRA Office (907) 484-2165, Selawik NANA Resource Office (907) 484-2377 or IRA NVS & Environmental (907) 484-2005 and ask for anyone involved with the Youths.